

Remarks

The Examiner has rejected claim 6 under 35 USC 112 as being indefinite. This rejection is moot in view of the foregoing amendment of the claims.

The Examiner has rejected under 35 USC 102(b) various of the claims as filed on the grounds that they are anticipated by Chang (US 4,725,113). Reconsideration is requested in light of the new claims and the following.

It can be seen from Chang that Chang seeks to adjust the polarisation of light input to a polariser in order to secure a polariser light output that has a single predetermined polarisation. It achieves this by means of mechanically squeezing an optical fibre in response to a polariser feedback signal. The polariser output signal is extracted from the optical fibre by means of an interaction region which is formed by removing the cladding and a portion of the core from a length of the optical fibre. Chang does not suggest the use of a fibre grating or imposing a differential time delay on orthogonal polarisation states travelling in the fibre in order to compensate for polarisation mode dispersion as is now claimed in all the independent claims presented herein for the Examiner's consideration. Consequently, Chang does not anticipate the present invention as defined by the new claims submitted herewith.

The Examiner has also raised a similar rejection of various of the claims with respect to the teaching of Strasser (US 6,137,924). Reconsideration is requested.

Strasser does disclose the use of a fibre grating (11;110) incorporated into a high birefringence fibre 32 for polarisation mode dispersion (PMD). However, the system taught by Strasser is based on a prior art wavelength dispersion compensation system employing a circulator to direct input light to be transmitted down said high birefringence fibre 32 to be reflected by the grating (11;110) such that it passes back along the high birefringence fibre 32 to the circulator for transmission on an output port 21 of the circulator. Thus, in the arrangement of Strasser, the function of the grating is to impose a differential time delay to wavelengths comprising the input rather than to any orthogonal polarisation states comprising such wavelengths. The differential time delay to be imposed on such orthogonal

polarisation states is provided instead by PMD delay means 31 which typically comprises a predetermined length of the high birefringence fibre 32 selected to offset the PMD of the fibre grating (DCG 11;110) (Strasser, column 4, lines 28-32). It can therefore be concluded from the teaching of Strasser that the fibre grating is not employed to impose a differential time delay on orthogonal polarisation states travelling in the fibre. This function is provided by the PMD delay means 31. It also follows that there is no requirement, nor indeed any suggestion in the teaching of Strasser, of seeking to adjust a parameter of the fibre grating in order to impose a differential time delay on the orthogonal polarisation states travelling in the fibre. Consequently, Strasser does not anticipate the present invention as defined by the new claims submitted herewith.

The Examiner has also rejected certain of the claims as filed under 35 USC 102(b) as being anticipated by Turpin (US 5,309,540). Reconsideration is requested.

Turpin teaches the provision of an optical fibre pressure sensor which employs a high birefringence optical fibre structure. However, Turpin does not disclose the use of a fibre grating incorporated into the high birefringence optical fibre nor the possibility of adjusting a parameter of such fibre grating. Consequently, it can be concluded that Turpin does not anticipate the present invention as defined by the new claims submitted herewith.

The Examiner has rejected various of the claims as filed under 35 USC 103(a) as being unpatentable over various prior art teachings. It is respectfully submitted that these rejections are moot in view of the manner in which the present invention is now defined by the new claims submitted herewith. It is quite clear that none of the prior art mentioned by the Examiner in his rejections under 35 USC 103(a), nor indeed any of the other prior art cited in this application but not specifically referred to in the office action, discloses the arrangement of the present invention in which a length of high birefringence optical fibre is provided with a fibre grating formed therein wherein a parameter, such as the length of said fibre grating, is adjustable in order to impose a differential time delay on orthogonal polarisation states travelling in the fibre. In an optical transmission system, great efforts are made to manufacture transmission optical fibre having zero birefringence. However, in practical terms, all optical fibres, no matter how carefully manufactured, display some degree of birefringence due to manufacturing tolerances, conditions of use, environmental factors.

etc. The present invention goes against conventional wisdom by seeking to employ in a transmission optical fibre a length of high birefringence fibre which, on its own, would exacerbate the polarisation mode dispersion characteristic of the transmission optical fibre so formed. However, by employing in the length of high birefringence optical fibre a fibre grating which is adjustable, it is possible to not only compensate for polarisation mode dispersion caused by the birefringence of said length of high birefringence optical fibre but also the birefringence which inevitably exists in the transmission optical fibre as well. The arrangement of the present invention could therefore be said to provide an unexpected method of compensating for polarisation mode dispersion in a transmission optical fibre.

Favorable reconsideration of this application is requested.

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